

WE CLAIM:

1. A pressure control system for controlling the pressure of a process fluid stream at a certain location, comprising:
  - a. a pressure regulator mounted downstream of an upstream process fluid line, the regulator having a closure member movable between open and closed positions for controlling process fluid flow through the fluid line, and a control chamber for housing an actuator fluid, wherein the position of the closure member changes in response to changes in the pressure of the fluid housed in the control chamber;
  - b. an inspirator having an inlet, an outlet, and a throat between the inlet and outlet, the control chamber of the regulator being in flow communication with the throat of the inspirator;
  - c. a primary pilot having a primary valve member in fluid communication with the outlet of the inspirator, the primary valve member being movable between open and closed positions to control the flow of actuator fluid exiting the outlet of the inspirator, the primary pilot having a target pressure chamber and a sensed pressure chamber and a linkage configured to move the position of the primary valve member in response to a pressure differential between the target and sensed pressure chambers, and wherein the sensed pressure chamber is in fluid communication with a sensing point along the process fluid line at which the pressure of the process fluid is to be controlled;
  - d. a secondary pilot having a secondary valve member mounted downstream of a supply of actuator fluid and upstream of the inspirator inlet and movable between open and closed positions to control the flow of actuator fluid to the inspirator, the secondary pilot having a target pressure chamber and a sensed pressure chamber and a linkage configured to move the position of the secondary valve member in response to a pressure

differential between the target and sensed pressure chambers;  
and

- e. a target pressure source in fluid communication with the target pressure chambers of the primary pilot and the secondary pilot and adjustable to select a desired pressure to be maintained at the sensing point in the process fluid stream.

2. closure member is diaphragm
3. stabilizing needle valve between target pressure source and target chamber of secondary pilot.
4. actuator fluid supply is independent of process fluid line